

IN THE CLAIMS

1. (Presently amended) A thin-film magnetic head comprising:  
a lower core layer;  
a recording core formed on the lower core layer and exposed at a face surface that faces a recording medium, the recording core comprising a structure selected from the group consisting of (1) a lower pole layer, a gap layer, and an upper pole layer sequentially arranged in that order and (2) a gap layer and an upper pole layer sequentially arranged in that order;  
an upper core layer magnetically coupled to the upper pole layer; and  
a coil for inducing a recording magnetic field to the lower core layer, the recording core, and the upper core layer,  
wherein a tip surface of the upper core layer contacts the upper pole layer and is located at a setback distance from the face surface in a height direction, wherein the height direction is a direction generally perpendicular to the face surface, and the tip surface is one of an inclined surface or a curved surface, such that the setback distance gradually increases in a track width direction from a point where the tip surface contacts the upper pole layer, wherein the track width direction is a direction generally parallel to the face surface.

2. (Original) A thin-film magnetic head according to Claim 1, wherein a shortest setback distance from the face surface to the tip surface of the upper core layer is equal to or less than a largest length of the recording core measured from the face surface.

3. (Currently amended) A thin-film magnetic head according to Claim 1, wherein the setback distance L3 from the face surface to the tip surface of the upper core layer satisfies the relationship about  $0 \mu\text{m} < L3 \leq$  about  $0.8 \mu\text{m}$ .

4. (Original) A thin-film magnetic head according to Claim 1, wherein the upper core comprises a back surface which is set back from the tip surface in the height direction, wherein the back surface is one of a curved surface or an inclined surface in which the setback distance gradually increases in the track width direction and an inclination angle  $\theta 2$  is greater than an inclination angle  $\theta 1$ , where inclination angle  $\theta 1$  is

one of the inclination angle of the inclined surface on the back surface relative to the height direction, or the angle of a tangent line at a midpoint between an end of the curved surface near the recording core and an end of the curved surface near an underside of the upper core layer side, and angle  $\theta 2$  is one of the inclination angle of an inclined surface on the tip surface of the upper core layer relative to the height direction, or the inclination of a tangent line at a midpoint between an end of the curved surface near the magnetic core and an end of the curved surface at an upper surface of the upper core layer.

5. (Original) A thin-film magnetic head according to Claim 4, wherein the inclination angle  $\theta 2$  satisfies the relationship about  $60^\circ \leq \theta 2 < \text{about } 90^\circ$ .

6. (Original) A thin-film magnetic head according to Claim 1, wherein the tip surface of the upper core layer comprises a curved surface which gradually recedes in the height direction and which recedes toward side surfaces of the tip surface, wherein the side surfaces are displaced apart from one another in the track width direction.

7. (Original) A thin-film magnetic head according to Claim 6, wherein tangent lines that touch endpoints of the curved surface have an angle of inclination relative to the track width direction of about  $30^\circ$  to about  $60^\circ$ .

8. (Original) A thin-film magnetic head according to Claim 1, wherein the upper core layer comprises:

a front region which extends from the tip surface in the height direction and has a uniform width in the track width direction; and

a back direction region which extends from a side opposite the tip surface in the height direction and in which the width of the back region in the track width direction gradually increases in the height direction.

9. (Original) A thin-film magnetic head according to Claim 1, wherein the upper core layer further comprises an edge surface in contact with the upper pole layer, and wherein, at the edge surface, the width of the upper core layer in the track width direction is greater than the width of the upper pole layer in the track width direction.

10. (Original) A thin-film magnetic head according to Claim 1, wherein the recording core comprises:

a front region which extends from the face surface in the height direction and has a uniform width in the track width direction; and

a back region which extends from the front region in the height direction and in which a width of the back region in the track width direction gradually increases in the height direction.

11. (Original) A thin-film magnetic head according to Claim 10, wherein the upper core layer is connected to at least the back region of the recording core.

12. (Original) A thin-film magnetic head according to Claim 1, wherein the gap layer comprises a nonmagnetic metallic material.

13. (Original) A thin-film magnetic head according to Claim 12, wherein the nonmagnetic metallic material is at least one material selected from the group consisting of NiP, NiPd, NiW, NiMo, Au, Pt, Rh, Pd, Ru, and Cr.

*Am*  
14.- 17. (Withdrawn)

18. (New) A thin-film magnetic head according to Claim 1 further comprising a second coil layer overlying the coil layer and separated therefrom by an insulating layer.

19. (New) A thin-film magnetic head comprising:

a lower core layer;

a recording core formed on the lower core layer and exposed at a face surface that faces a recording medium, the recording core comprising a lower pole layer, a gap layer, and an upper pole layer sequentially arranged in that order;

an upper core layer magnetically coupled to the upper pole layer; and

a first coil layer and a second coil layer overlying the first coil layer, the first and second coil layers inducing a recording magnetic field to the lower core layer, the recording core, and the upper core layer,

wherein a tip surface of the upper core layer contacts the upper pole layer and is located at a setback distance from the face surface in a height direction, wherein the height direction is a direction generally perpendicular to the face surface, and the tip surface is a curved surface, such that the setback distance gradually increases in a track width direction from a point where the tip surface contacts the upper pole layer, wherein the track width direction is a direction generally parallel to the face surface.

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